R & D CATALOG FORM

DATE: 6 January 1966

1. PROJECT TITLE/CODE NAME: Direct (Virtual) Image Viewer

2. SHORT PROJECT DESCRIPTION: Further development of a production model viewer is required.

3. CONTRACTOR NAME: 25X1A

4. LOCATION OF CONTRACTOR: 25X1A

5. CLASS OF CONTRACTOR: Manufacturer

6. TYPE OF CONTRACT: N/A

7. FUNDS: FY 19 65 $ / FY 19 66 $ / FY 19 67 $

8. REQUISITION NO.: N/A

9. BUDGET PROJECT NO.: NP-DV-5

10. EFFECTIVE CONTRACT DATE (Begin - end): June 1966 - June 1967

11. SECURITY CLASS.: A.A. - Confidential; T. - Unclassified; W. - Unclassified

25X1A

12. RESPONSIBLE DIRECTORATE/OFFICE/PROJECT OFFICER TELEPHONE EXTENSION: DDI/NPIC/P&DS/

13. REQUIREMENT/AUTHORITY

There is a continuing requirement for a new method of high resolution viewing without the image degradation of rear-projection screens and without the physiological contraint of microscopes.

14. TYPE OF WORK TO BE DONE

Engineering Development

15. CATEGORIES OF EFFORT

MAJOR CATEGORY	SUB-CATEGORIES
Direct Viewing	N/A

16. END ITEM OR SERVICES FROM THIS CONTRACT/IMPROVEMENT OVER CURRENT SYSTEM, EQUIPMENT, ETC.

Monthly reports, final report, operating manual, production model viewer.

Better uniformity in intensity of image (improved grating), larger exit pupil, improved controls, possible stereo capability.

17. SUPPORTING OR RELATED CONTRACTS (Agency & Other)/COORDINATION

The Agency has sponsored the development of a preliminary, prototype direct image viewer, to be delivered by February 1966. Contacts throughout industry and Government have revealed no concurrent or previous similar developments.

18. DESCRIPTION OF INTELLIGENCE REQUIREMENT AND DETAILED TECHNICAL DESCRIPTION OF PROJECT (Continue on additional page if required)

The Direct (Virtual) Image Viewer employs a unique approach to high resolution rear-projection viewing of photographic films. Diffraction gratings and a large field lens are used to provide an observer with an enlarged aerial image which can be viewed simultaneously with both eyes without the use of a screen.

(Continued)

19. APPROVED BY AND DATE

OFFICE	DEPUTY DIRECTOR	DDCI

18. The various characteristics of this viewer are listed below.

1) Magnification - dual magnifications of 5X and 50X.

2) Observable Film Area - the observable film area consists of a two (2) inch by two (2) inch square area in the film plane at 5X magnification, and two-tenths inch by two-tenths inch square area in the film plane at 50X magnification.

3) Film Size - the viewer accepts for viewing single frames of either 4 x 5 inch or 70mm x 100mm film chips.

4) Exit Pupil Size - the size of the composite exit pupil is at least 3.5 inches square.

5) System Resolution - at 5X magnification, the viewer is capable of providing a system AWAR resolution of 20 lines per millimeter over the used field when referred to a low contrast target in the object plane. At 50X magnification, the viewer is capable of providing an on-axis resolution of 200 lines per millimeter at the film plane with a low contrast target.

6) Light Intensity - the illumination system is variable and presents to the eye, with an open film gate, that amount of light flux as presented to the eye by a lambertian source with illuminance of 100 ft-lamberts.

7) Illumination Spectrum - the illumination of the viewer system is contained in a narrow portion of the spectrum centered around 508.6 millimicrons. Various filters may be used to provide different band passes.

8) Film Positioning - the viewer incorporates a provision for remote film positioning through X and Y translations to permit full coverage viewing areas for either 70mm or 5 inch film chips.

9) Focusing - manual fine focusing control is provided for each magnification.

10) Film Temperature - the temperature of film when mounted in the film plane of the viewer during operation does not exceed 90°F with an average density (silver) of 0.8.

11) Viewer Controls - the control panel contains the following:

a) main power - ON/OFF
b) lamp ON/OFF
c) illumination intensity control

18. d) magnification selector - 5X and 50X
e) lens focus - 5X and 50X
f) film translation ± 2 inch X
± 2 inch Y

12) Physical Size - the viewer has the following general dimensions:

length - 81 inches

height - 23 inches

width - 29 inches